

MUD FLAP HOLDER SYSTEM

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TECHNICAL FIELD

The present invention relates to apparatus including mud flap holder structure which enables a mud flap on a truck or
10 other motor vehicle to be released from the vehicle when trapped between the ground and a tire or when other pulling forces of a predetermined magnitude are applied to the mud flap to avoid damage to the mud flap and holder structure.

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BACKGROUND OF THE INVENTION

Mud flap holders on large trucks are in close proximity to the driving wheels. It is a common failure mode for these flaps to become trapped between the ground and the tires, when the vehicle is traveling in reverse. This creates a strong
20 pulling force on the flap and flap holder structure which can damage or break one or both components.

There have been various approaches meant to address this problem - typically involving a spring released channel mechanism, which is added to a standard flap and flap holder. Other designs use a series of metal stampings, working in conjunction with rubber sliding components. Such approaches add to the cost and complexity of the flap holder system and have reliability problems.

As will be seen below, in accordance with the teachings of the present invention, an existing flap holding system in widespread use is modified to provide a reliable mud flap release system. No supplemental structural components, with their attendant costs, are required to convert a standard mud flap holder assembly to one which enables a mud flap to be released when pulling forces are applied thereto to prevent damage to either the flap or the holder assembly associated therewith.

A search directed to the invention disclosed and claimed herein located the following United States Patents: U.S. Patent No. 3,684,312, issued August 15, 1972, U.S. Patent No. 3,333,868, issued August 1, 1967, U.S. Patent No. 5,915,708, issued June 29, 1999, U.S. Patent No. 6,116,628, issued September 12, 2000, U.S. Patent No. 5,967,553, issued October 19, 1999, U.S. Patent No. 1,809,711, issued June 9, 1931, U.S. Patent No. 3,934,901, issued January 27, 1976, U.S. Patent No. 4,795,121, issued January 3, 1989, U.S. Patent No. 5,044,667,

issued September 3, 1991, and U.S. Patent No. 4,695,070, issued September 22, 1987. The arrangements disclosed in the above-identified patents do not teach or suggest the invention disclosed and claimed herein.

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DISCLOSURE OF INVENTION

The present invention relates to a system which allows for the separation without damage of a mud flap from a holder assembly when pulling forces are exerted on the mud flap without causing damage to the flap, the assembly or related structure.

10 The invention allows the user to easily reconnect the flap and holder. The invention does not incorporate the use of supplemental structure to carry out these objectives.

The present invention incorporates a combination including a mud flap having a top portion with a hole formed therein and a support member attachable to a motor vehicle.

15 Also incorporated in the combination is at least one mud flap support clip having a bifurcated clip segment forming a variable width slot open at one end.

20 A mud flap securement bolt passes through the hole in the top portion of the flap and is positioned in the slot. The mud flap securement bolt is frictionally engaged by the bifurcated clip segment to releasably retain the mud flap securement bolt in the slot and attached to the mud flap support clip until a pulling force exerted on the mud flap attains a

predetermined magnitude. The mud flap support clip releases the mud flap securement bolt and the mud flap responsive to the pulling force.

The invention also encompasses unique mud flap holder assembly structure and a mud flap support clip of novel character.

Other features, advantages and objects of the present invention will become apparent with reference to the following description and accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a perspective view of a prior art mud flap support clip in current widespread usage;

Fig. 2 is a front, elevational view of the prior art mud flap support clip;

Fig. 3 illustrates the prior art support clip holding a mud flap, the support clip being disposed on an elongated support member, only portions of the support member and mud flap being shown;

Fig. 4 is a perspective view illustrating a prior art mud flap holder assembly incorporating the support clip shown in Figs. 1 - 3 and illustrating a mud flap being torn away therefrom and damaged when caught between a wheel and the ground;

Fig. 5 is a perspective view of a mud flap support clip constructed in accordance with the teachings of the present

invention;

Fig. 6 is a front, elevational view of the support clip of Fig. 5;

Fig. 7 is a view similar to Fig. 3, but illustrating
5 use of the support clip of the present invention;

Fig. 8 is a view similar to Fig. 4, but illustrating what happens when a mud flap is pulled away from a mud flap holder assembly constructed in accordance with the teachings of the present invention;

10 Fig. 9 is a perspective view illustrating installation of a conventional mud flap and mud flap securement bolt on the support clip of the present invention;

Fig. 10 is a front, elevational view of the support clip of the present invention retaining at a location within the
15 clip a mud flap securement bolt, the latter being shown in cross-section;

Fig. 11 is a view similar to Fig. 10, but illustrating the appearance of the support clip when the bolt is disposed below its normal retention position, for example when the bolt is
20 being installed in place or being pulled from the clip;

Fig. 12 is an enlarged, cross-sectional view taken along the line 12-12 in Fig. 7; and

Fig. 13 is an enlarged, cross-sectional view taken along the line 13-13 in Fig. 3.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring now to Figs. 1 - 4 and 13, a conventional mud flap support clip and mud flap holder assembly are illustrated.

5 The conventional mud flap support clip 10 is of integral construction, typically being formed from sheet metal. The support clip 10 has a flat central portion 12 which is positioned on and engages a support member 14 in the form of an elongated bent bar affixed to a vehicle 16 by a bracket 18. Fig.
10 4 shows four support clips 10 on the support member.

Integral with and extending downwardly from central portion 12 are two clip segments 20, 22. Holes 24 are formed in the clip segments.

Conventional mud flap 30 depends from the support clips
15 10. The mud flap has four apertures (not shown) formed therein which are placed in alignment with holes 24 of the support clips. Mud flap securement bolts 32 extend through holes 24 and the holes in the top portion of the flap and the mud flap is secured in place by applying nuts 34 (see Fig. 13) to the bolts and
20 tightening them in place.

While a stable support for a mud flap is provided by the above-described prior art approach, a problem occurs when a pulling force of large magnitude is applied to the mud flap 30, for example when the mud flap is caught between the ground and a

tire of the vehicle with which it is associated when the vehicle backs up. As shown in Fig. 4, this typically results in tearing or ripping of the mud flap so that it can no longer be used. It is quite possible that the mud flap holder assembly itself can be severely damaged or broken.

Figs. 5 - 12 show an arrangement similar to that illustrated in Figs. 1 - 4 and 13 except that a mud flap support clip 50 constructed in accordance with the teachings of the present invention is shown and utilized in the mud flap holder assembly. Components and parts the same as those shown in Figs. 1 - 4 and 13 have been designated by like reference numbers.

Mud flap support clip 50 is of integral construction and may suitably be formed of sheet metal having some degree of flexibility and resiliency. Support clip 50 includes a central clip portion 52 which in the illustrated embodiment has an opening formed at the top thereof to facilitate welding of the clip to the top of support member 14. This feature, however, is not part of the present invention and is known.

The clip 50 also includes two clip segments 54, 56 extending downwardly from the central clip portion and disposed side-by-side to define a space therebetween for receiving the top portion of mud flap 30.

Each of the clip segments 54, 56 has a bifurcated end portion defining an open-ended, variable width slot 60 for

receiving the shaft of mud flap securement bolt 32. This is to be compared to the completely enclosed hole 24 found in conventional clip 10. Slot 60 is enlarged at a predetermined location thereon as indicated by reference numeral 62. That is, the slot narrows below the predetermined location 62, with the bifurcated clip end portions being spaced apart a distance less than at the location of the mud flap securement bolt in the widened or enlarged area 62 of the slot. Thus, each clip segment forms a detent below location 62 to hold the mud flap in position during use. The configuration of the slot at location 62 approximates the outer configuration of the bolt shaft and the slot below the location of the shaft is narrow enough for the clip segments to engage the underside of the bolt shaft to some degree.

As indicated above, a material from which the support clip 50 is formed, which may for example be sheet steel, has a degree of flexibility and resiliency. Fig. 10 shows the bolt shaft of the bolt 32 in its normal position when retained in the support clip and Fig. 11 shows the bolt shaft below such position. The clip segments 54, 56 have sufficient flexibility and resiliency to enable the bifurcated portions thereof to

temporarily separate to a greater degree when the bolt is either being pulled from the support clip or reinstalled therein. As
5 shown in Fig. 8, when the mud flap is pulled free of all of the clips it remains intact. This readily allows reinstallation of the flap.